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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/697,437	10/31/2003	Homa Afjeh	08350.2197-00	7759

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EXAMINER
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CHANG, CHING

ART UNIT	PAPER NUMBER
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3748

DATE MAILED: 03/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/697,437	<b>Applicant(s)</b> AFJEH ET AL.	
	<b>Examiner</b> Ching Chang	<b>Art Unit</b> 3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 01/11/2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-21, 24-26 and 28-44 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21, 24-26 and 28-44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01/11/2005 has been entered.

Claims 22-23, and 27 are cancelled, and new claims 28-44 are added as requested.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**2. Claims 1, 12, 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Hu (US Patent 5,537,976).**

Hu disclose a valve actuation system and the method of using it for an engine (See Figs. 1, 3, and 5) having a piston movable through an intake stroke followed by a compression stroke, the said engine having a block defining at least one cylinder (part of 10) and a cylinder head (20) having at least one intake port; at least one intake valve (30) associated with the at least one intake port; a cam assembly (40, 42a, 42b) connected to the intake valve to move open and close the at least one intake port; and a separate actuator (52) electromagnetically operated to selectively close the intake port at a different timing than the cam assembly (See Figs. 2a, 2c-2f, 4a, 4c-4f, 6a, 6c, and 6f).

**3. Claims 21, 24-25, 26, 28, 29-30, and 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Bloms et al. (US Patent 6,807,929).**

Bloms discloses a valve actuation system (44) and the method of using it for an engine having a piston movable through an intake stroke followed by a compression stroke, the said engine having at least one cylinder (22) and at least one intake port (36) associated with the at least one cylinder (See Fig. 3), comprising: an intake valve (32); a cam assembly (52, 60) mechanically linked to the intake valve to open and close the at least one intake port; and an electromagnetic actuator selectively mechanically linked to the intake valve to selectively close the at least one intake port at a different timing than the cam assembly (See Col. 3, line 58 through Col. 10, line 57); further including a pivotable rocker arm (64) operably coupling the cam assembly with the

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intake valve, wherein the rocker arm disposed between the cam assembly and the electromagnetic actuator, wherein the core includes an end configured to selectively engage an end of the rocker arm opposite to the intake valve; and a controller (100) configured to move the armature and the core between a first position and a second position; wherein the cam is configured to engage an end of the rocker arm opposite the core; wherein the electromagnetic actuator is a latching solenoid; the said method comprising moving an intake valve via a rocker arm to open and close an intake port; during the intake stroke of the piston; engaging a cam with an end of the rocker arm to affect movement of the intake valve; and engaging an electromagnetic solenoid with an end of the rocker arm opposite the cam to selectively hold the intake valve open, wherein engaging includes controllably moving a coupled armature and core of the electromagnetic actuator between a first position and a second position.

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

**4. Claims 29, and 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Weber et al. (US Patent 6,688,280).**

Weber discloses a valve actuation system (214) and the method of using it for an engine having a piston movable through an intake stroke followed by a compression stroke, the said engine having at least one cylinder (112) and at least one intake port (208) associated with the at least one cylinder (See Fig. 2), comprising: an intake valve (218); a cam assembly (232, 234, 236) mechanically linked to the intake valve to open and close the at least one intake port; and an electromagnetic actuator selectively mechanically linked to the intake valve to selectively close the at least one intake port at a different timing than the cam assembly (See Col. 5, line 23 through Col. 6, line 47; Col. 9, line 59 through Col. 11, line 7); further including a pivotable rocker arm (226) operably coupling the cam assembly with the intake valve, and a controller (244).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

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**5. *Claims 1-2, 12, and 17-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Bloms (US Patent 6,807,929).***

Bloms disclose a valve actuation system and the method of using it for an engine (See Figs.3) having a piston movable through an intake stroke followed by a compression stroke, the said engine having a block (28) defining at least one cylinder (22) and a cylinder head (30) having at least one intake port (36); at least one intake valve (32) associated with the at least one intake port; a cam assembly (52, 60) connected to the intake valve to move open and close the at least one intake port; and a separate actuator electromagnetically operated to selectively close the intake port at a different timing than the cam assembly (See Col. 3, line 58 through Col. 10, line 57); further including a pivotable rocker arm (64) operably coupling the cam assembly with the intake valve, and a controller (100); wherein the separate actuator is a latching solenoid.

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

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6. ***Claims 1, 12, and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Weber (US Patent 6,688,280).***

Weber disclose a valve actuation system (214) and the method of using it for an engine (See Figs. 2) having a piston movable through an intake stroke followed by a compression stroke, the said engine having a block defining at least one cylinder (112) and a cylinder head having at least one intake port (208); at least one intake valve (218) associated with the at least one intake port; a cam assembly (232, 234, 236) connected to the intake valve to move open and close the at least one intake port; and a separate actuator electromagnetically operated to selectively close the intake port at a different timing than the cam assembly (See Col. 5, line 23 through Col. 6, line 47; Col. 9, line 59 through Col. 11, line 7); further including a pivotable rocker arm (226) operably coupling the cam assembly with the intake valve, and a controller (244).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.



**7. *Claims 1-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Saki et al. (US Patent Application Publication US 2004/0168685).***

Saki discloses a valve actuation system and the method of using it for an engine (See Figs. 3, 13, and 19) having a piston movable through an intake stroke followed by a compression stroke, the said engine having a block defining at least one cylinder (4) and a cylinder head having at least one intake port (See Fig. 2); at least one intake valve (IV1, IV2) associated with the at least one intake port (3a); a cam assembly (10, 11) connected to the intake valve to move open and close the at least one intake port; and a separate actuator (29) electromagnetically operated to selectively close the intake port at a different timing than the cam assembly; wherein the separate actuator is a latching solenoid; wherein the separate actuator includes a solenoid coil (37) and an armature (39) coupled with a core (40), the armature and the core being movable together relative to the solenoid coil; further including a pivotable rocker arm (12) operably coupling the cam assembly with the intake valve; wherein the core includes an end configured to selectively engage an end of the rocker arm opposite to the intake valve; further including a controller (ECU 2) configured to move the armature and the core between a first position and a second position; wherein the controller is configured to apply a first current to the solenoid coil to move the armature and the core from the first position to the second position to engage the rocker arm to modify a timing of the intake valve; wherein the electromagnetic actuator is configured such that the armature and the core remain at the first position when the controller removes the first current; wherein the controller is configured to apply a second current to the solenoid coil to

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move the armature and the core from the second position to the first position to disengage from the rocker arm, the second current being opposite to the first current; wherein the electromagnetic actuator is configured such that the armature and the core remain at the second position when the controller removes the second current; wherein the controller is configured to apply a third current to the solenoid coil to move the armature and the core from the first position to the second position to engage the rocker arm to slow a closing velocity of the intake valve (See Figs. 7-11; Paragraph [0070], Page 7, through Paragraph [121], Page 13).

8. ***Claims 21, 24-26, and 28-44 are rejected under 35 U.S.C. 102(e) as being anticipated by Saki et al. (US Patent Application Publication US 2004/0168685).***

Saki discloses Blooms discloses a valve actuation system and the method of using it for an engine having a piston movable through an intake stroke followed by a compression stroke (See Figs. 3, 13, 19), the said engine having at least one cylinder (4) and at least one intake port associated with the at least one cylinder (See Fig. 2), comprising: an intake valve (IV1, IV2); a cam assembly (10, 11) mechanically linked to the intake valve to open and close the at least one intake port; and an electromagnetic actuator (29) selectively mechanically linked to the intake valve to selectively close the at least one intake port at a different timing than the cam assembly (See Fig. 6); wherein the electromagnetic actuator is a latching solenoid; wherein the electromagnetic actuator includes a solenoid coil (37) and an armature (39) coupled with a core (40), the armature and the core being movable together relative to the

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solenoid coil; further including a pivotable rocker arm (12) operably coupling the cam assembly with the intake valve; wherein the core includes an end configured to selectively engage an end of the rocker arm opposite to the intake valve; further including a controller (ECU 2) configured to move the armature and the core between a first position and a second position; wherein the cam (11) is configured to engage an end of the rocker arm opposite the core; wherein the controller is configured to apply a first current to the solenoid coil to move the armature and the core from the first position to the second position to engage the rocker arm to modify a timing of the intake valve; wherein the electromagnetic actuator is configured such that the armature and the core remain at the first position when the controller removes the first current; wherein the controller is configured to apply a second current to the solenoid coil to move the armature and the core from the second position to the first position to disengage from the rocker arm, the second current being opposite to the first current; wherein the electromagnetic actuator is configured such that the armature and the core remain at the second position when the controller removes the second current; wherein the controller is configured to apply a third current to the solenoid coil to move the armature and the core from the first position to the second position to engage the rocker arm to slow a closing velocity of the intake valve (See Figs. 7-11; Paragraph [0070], Page 7, through Paragraph [121], Page 13); the said method comprising moving an intake valve (IV1) via a rocker arm (12) to open and close an intake port; during the intake stroke of the piston; engaging a cam (11) with an end of the rocker arm to affect movement of the intake valve; and engaging an electromagnetic solenoid with an end of the rocker arm

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opposite the cam to selectively hold the intake valve open, wherein engaging includes controllably moving a coupled armature and core of the electromagnetic actuator between a first position and a second position (See Paragraph [0070], Page 7, through Paragraph [121], Page 13).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. ***Claims 31-39, and 41-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bloms et al. (as applied to claims 30, and 40 above) in view of Sturman et al. (US Patent No. 5,720,261).***

Bloms discloses the invention, however, fails to disclose the electromagnetic actuator being controlled by an adjusted current to control the engine valve movement.

The patent to Sturman on the other hand, teaches that it is conventional in the art of a valve controller system, to utilize a controller (See Figs. 8-20) with a latching solenoid actuator (118, 162) having the armature and the core being movable together relative to the solenoid coil (See Figs. 4-7), to selectively control a valve movement by an adjustment of the current through the said actuator.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the latching solenoid actuator and the control method on it as taught by Sturman in the Blooms device and the method of using it, since the use thereof would provide an improved engine valve actuation system, which would adjust an engine valve movement more flexibly and reduce the valve seating speed.

**11. *Claims 30-39, and 41-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weber et al. (as applied to claims 29, and 40 above) in view of Sturman et al. (US Patent No. 5,720,261).***

Weber discloses the invention, however, fails to disclose the electromagnetic actuator being a latching solenoid actuator.

The patent to Sturman on the other hand, teaches that it is conventional in the art of a valve controller system, to utilize a controller (See Figs. 8-20) with a latching solenoid actuator (118, 162) having the armature and the core being movable together relative to the solenoid coil (See Figs. 4-7), to selectively control a valve movement.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the latching solenoid actuator and the control method on it as taught by Sturman in the Blooms device and method, since the use thereof would provide an improved engine valve actuation system and the method of using it, which would adjust an engine valve movement more flexibly and reduce the valve seating speed.

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**12. Claims 2-11, 13-16, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weber et al. (as applied to claims 1, 12, and 17 above) in view of Sturman et al. (US Patent No. 5,720,261).**

Weber discloses the invention, however, fails to disclose the separate actuator being a latching solenoid actuator.

The patent to Sturman on the other hand, teaches that it is conventional in the art of a valve controller system, to utilize a controller (See Figs. 8-20) with a latching solenoid actuator (118, 162) having the armature and the core being movable together relative to the solenoid coil (See Figs. 4-7), to selectively control a valve movement.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the latching solenoid actuator and the control method on it as taught by Sturman in the Blooms device and method, since the use thereof would provide an improved engine valve actuation system and the method of using it, which would adjust an engine valve movement more flexibly and reduce the valve seating speed.

**13. Claims 3-11, 13-16, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bloms et al. (as applied to claims 1, 12, and 17 above) in view of Sturman et al. (US Patent No. 5,720,261).**

Bloms discloses the invention, however, fails to disclose the separate actuator being controlled through a given current to actuate the intake valve movement.

The patent to Sturman on the other hand, teaches that it is conventional in the art of a valve controller system, to utilize a controller (See Figs. 8-20) with a latching solenoid actuator (118, 162) having the armature and the core being movable together relative to the solenoid coil (See Figs. 4-7), to selectively control a valve movement.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized the latching solenoid actuator and the control method on it as taught by Sturman in the Blooms device and method, since the use thereof would provide an improved engine valve actuation system and the method of using it, which would adjust an engine valve movement more flexibly and reduce the valve seating speed.

### ***Response to Arguments***

14. Applicant's arguments with respect to claims 1-27 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

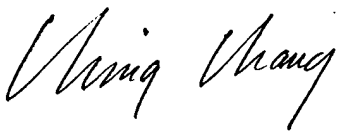
15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ching Chang whose telephone number is (571)272-4857. The examiner can normally be reached on M-Th, 7:00 AM -5:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571)272-4859. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patent Examiner



Ching Chang



THOMAS DENION  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3700